



**ENDANGERED
WILDLIFE TRUST**
Protecting forever, together



AN EYE IN THE SKY

**USING GPS-TRACKED VULTURES TO ADDRESS AFRICA'S WILDLIFE
POISONING CRISIS**

**Savannah Science Network Meeting
Skukuza, March 2025**



**South African
NATIONAL PARKS**



ENDANGERED WILDLIFE TRUST, BIRDS OF PREY PROGRAMME
Gareth Tate & John Davies

AFRICA'S VULTURE CRISIS

The decline of Africa's vultures



SAVANNAH VULTURES?



HOODED VULTURE



WHITE-HEADED VULTURE



WHITE-BACKED VULTURE



CAPE VULTURE



LAPPET-FACED VULTURE



SOUTH AFRICAN SAVANNAH VULTURE SPECIES





5

WHITE-BACKED
VULTURE



CRITICALLY
ENDANGERED
CR

WHITE-BACKED VULTURE

Gyps africanus

“OVERALL IT IS SUSPECTED TO HAVE UNDERGONE A VERY RAPID DECLINE OF 63-89% OVER THREE GENERATIONS OWING TO INTENTIONAL AND UNINTENTIONAL POISONING...”

LEAST CONCERN
LC



NEAR THREATENED
NT



ENDANGERED
EN



CRITICALLY ENDANGERED
CR



2004

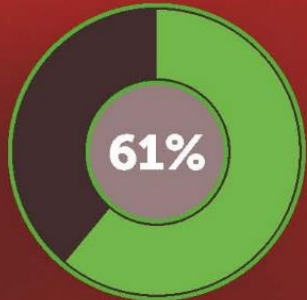
2007

2012

2015

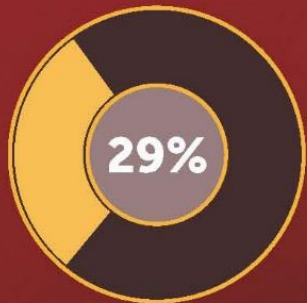
WHAT THREATENS AFRICA'S VULTURES?

Percentages are only representative reasons for recorded deaths. Other important threats, as yet hard to quantify, such as habitat reduction, disturbance at nesting sites and reduced food availability are not illustrated



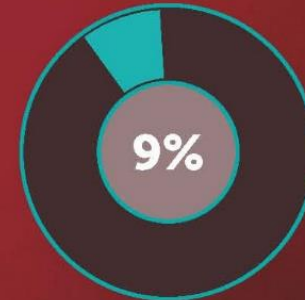
POISONING

- › Poisoning as a result of human-wildlife conflict where vultures are incidental victims.
- › Intentional poisoning by ivory poachers not wanting to be found by rangers.



PERSECUTION

- › For body parts used in traditional medicine.
- › Also involves the use of poison.



ELECTROCUTION & COLLISION

- › With poorly-planned powerlines, windfarms and roads.
- › Increasing threat with investment in development.



OTHER RECORDED KILLING

- › People are potentially eating poisoned vultures.



MULTI-SPECIES ACTION PLAN TO CONSERVE AFRICAN-EURASIAN VULTURES (VULTURE MSAP)

CMS Raptors MOU Technical Publication No. 5.
CMS Technical Series No. xx



What are the threats?



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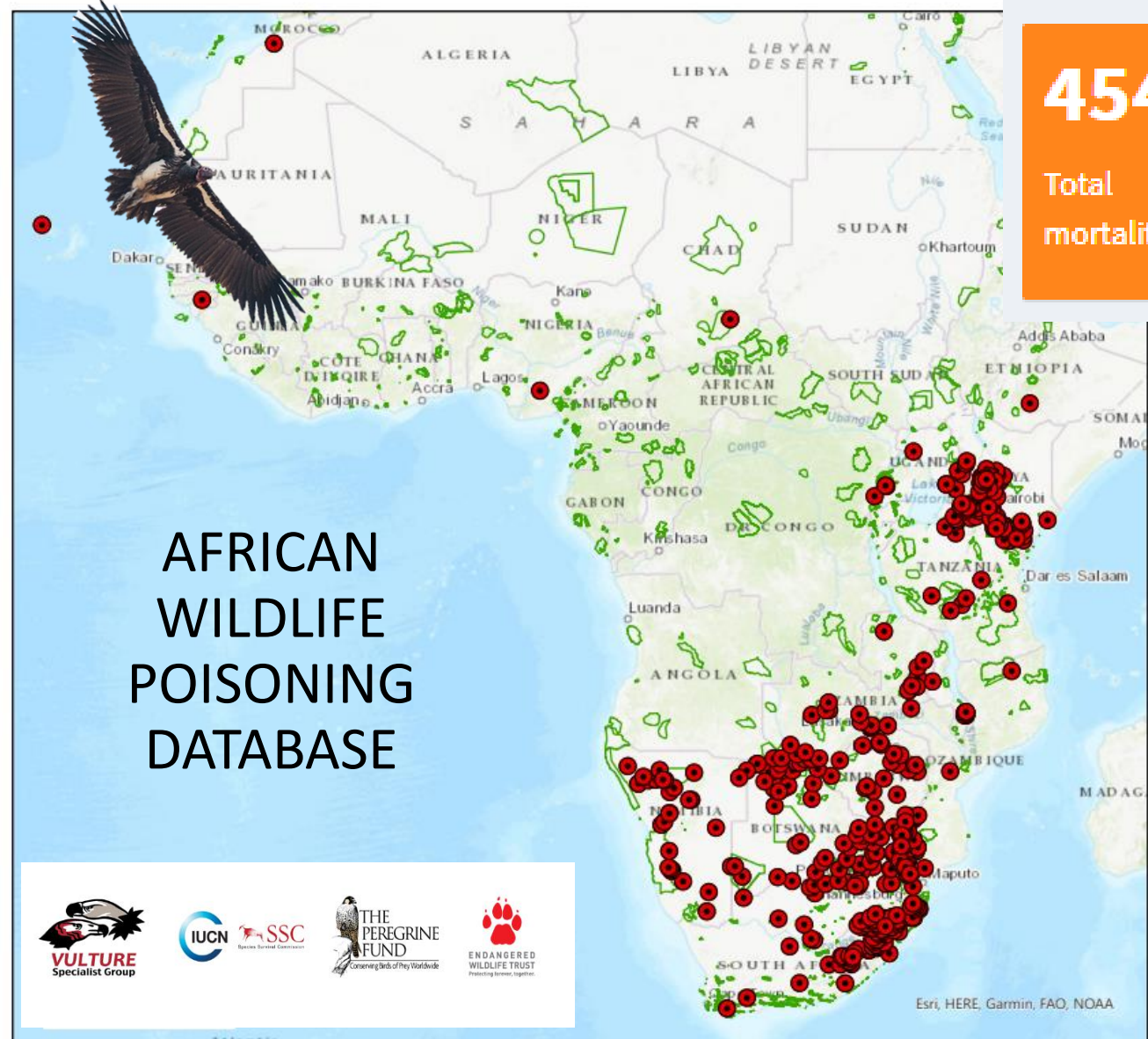
WHY ARE VULTURES SO VULNERABLE TO POISONING?

- Highly mobile - obligate scavengers
- Generation length
- Slow reproductive rate
- Clutch size
- Social feeding behaviour





Mass poisoning events

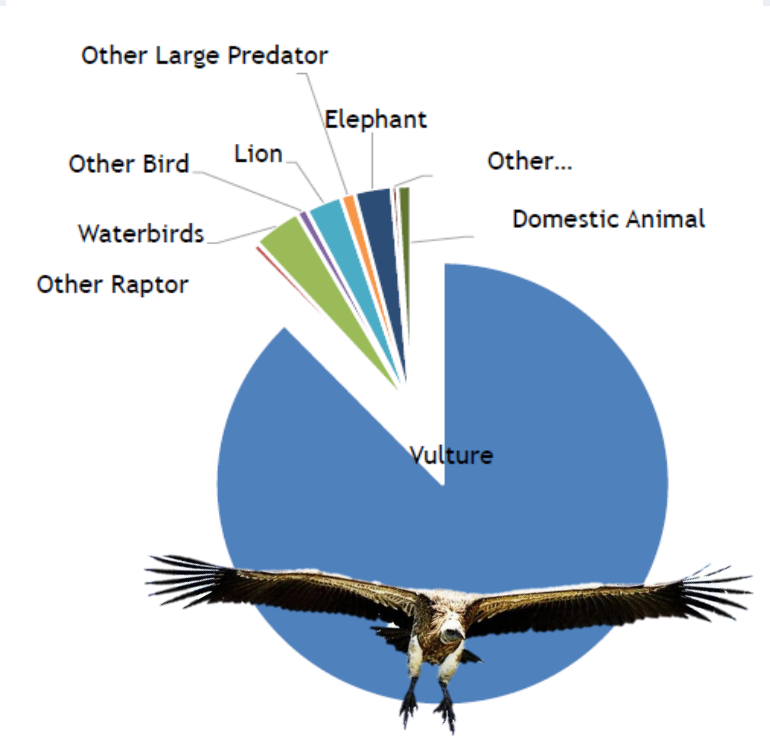


AFRICAN WILDLIFE POISONING DATABASE

45434
Total mortalities

1574
Total poisoning incidents

16175
Total vulture mortalities

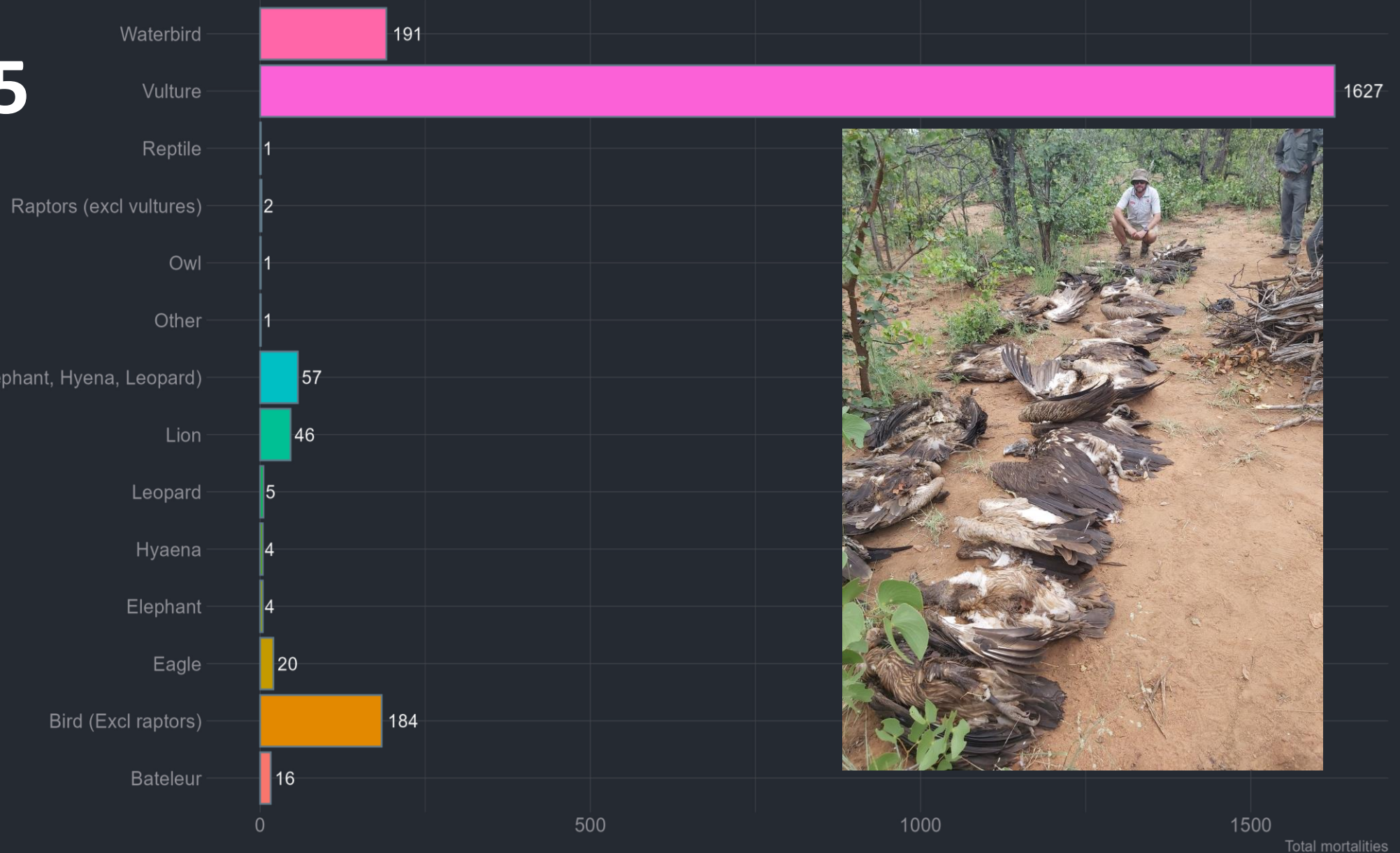


WILDLIFE POISONING FATALITIES

species
2014-2025

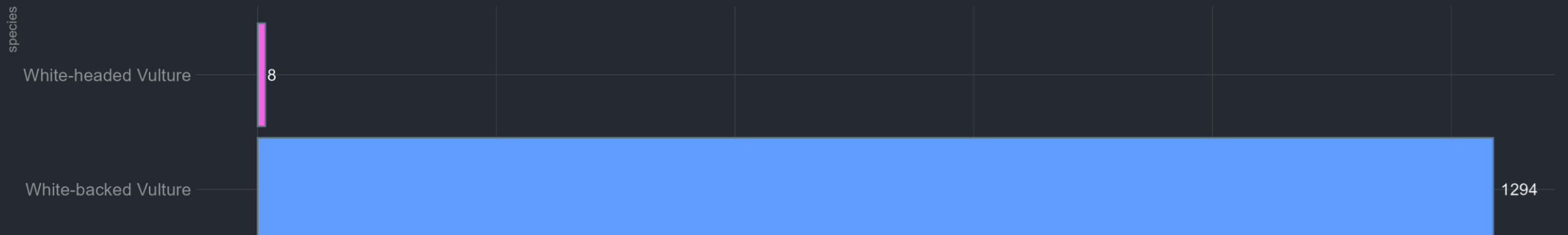
GLTFCA

**2,159
fatalities**

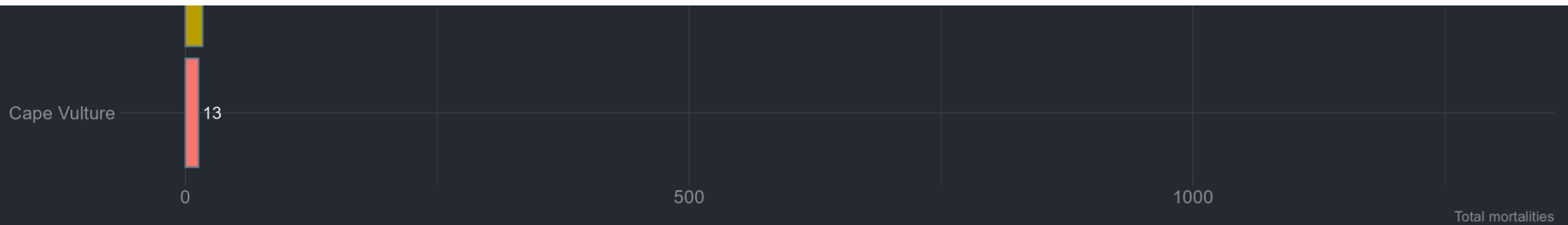


Total mortalities

WILDLIFE POISONING FATALITIES



Species	2012-2015 Active nests	2020-2023 Active nests
White-backed vulture <i>Gyps africanus</i>	892	542
White-headed vulture <i>Trigonoceps occipitalis</i>	48	27
Lappet-faced vulture <i>Torgos tracheliotus</i>	44	19
Total	984	588



Total mortalities



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VULTURE POISONING

what are the challenges?



PREVENTION

DIRECT POISONING

Sentinel poisoning



Harvesting of body parts for muthi/trade



VULTURE POISONING

INDIRECT POISONING

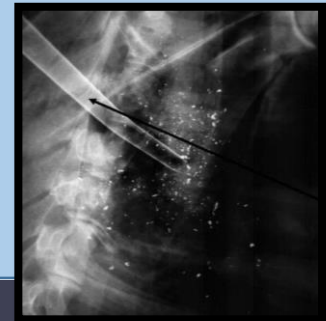
Feed on poisoned "problem carnivores"/crop destroying spp



Feed on animals poisoned for meat/muthi/skins



Lead containing ammunition

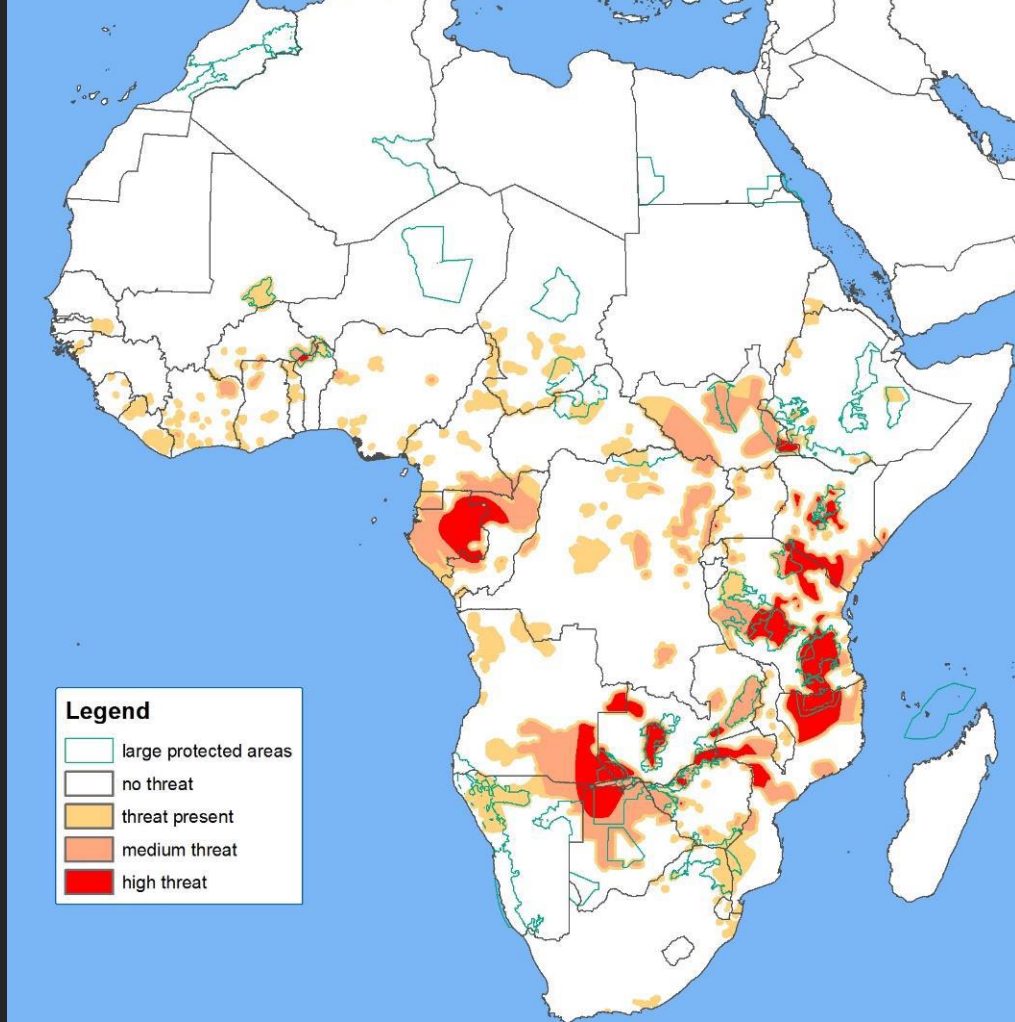




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VULTURE POISONING

what are the challenges?



DETECTION

EWT WILDLIFE POISONING RESPONSE TRAINING Initiated in 2014



The EWT-HCT-UR
Partnership





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AN EYE IN THE SKY

The application of vulture tracking data
as a way of detecting poisoning and
feeding events.



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MAX-PLANCK-GESELLSCHAFT



AN EYE IN THE SKY

USING GPS-TRACKED VULTURES TO ADDRESS AFRICA'S WILDLIFE POISONING CRISIS

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GPS tracking
technology +
vulture
foraging =
area
surveillance

☰

32 km/h

Speed

Distance *0.01 of 107.76 km*

Altitude **1516 m**

Rate Of Climb *0.1 m/s*

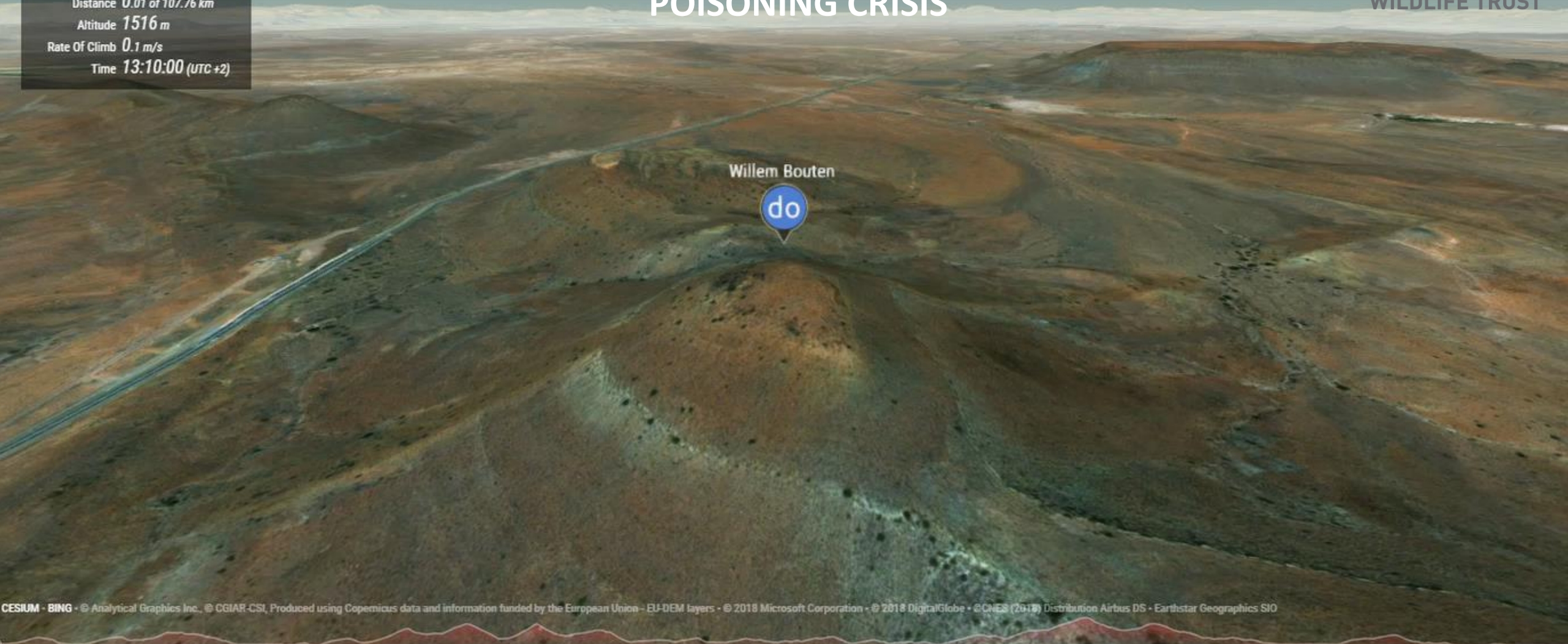
Time **13:10:00 (UTC +2)**

AN EYE IN THE SKY

USING GPS-TRACKED VULTURES TO ADDRESS AFRICA'S WILDLIFE POISONING CRISIS



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EARLY DETECTION OF POISONING EVENTS

Onboard activity sensors to alert us to mortality risk

= EARLY DETECTION OF POISONING



EARLY DETECTION OF POISONING EVENTS





RAPID RESPONSE TO WILDLIFE POISONING EVENTS



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Treatment of Survivors



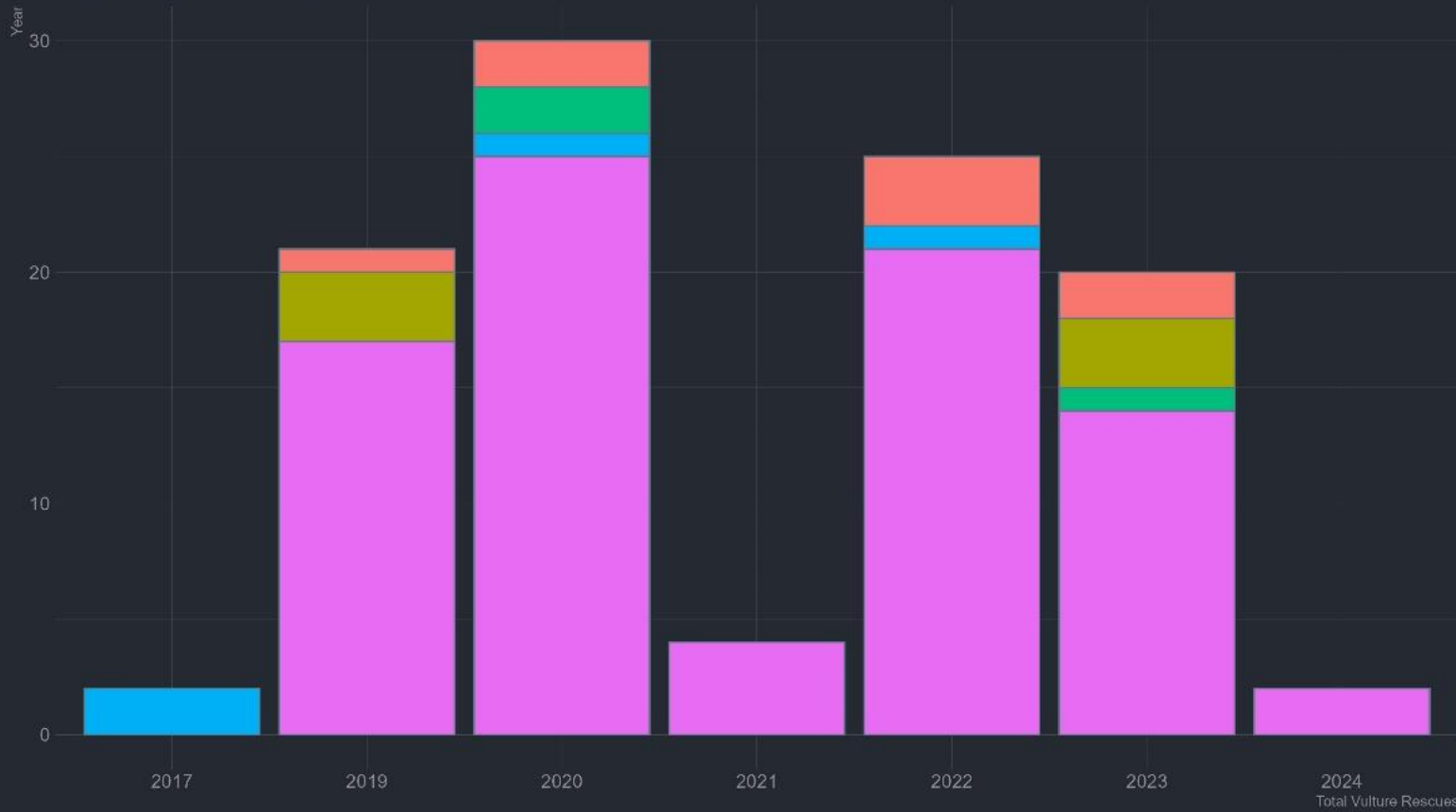


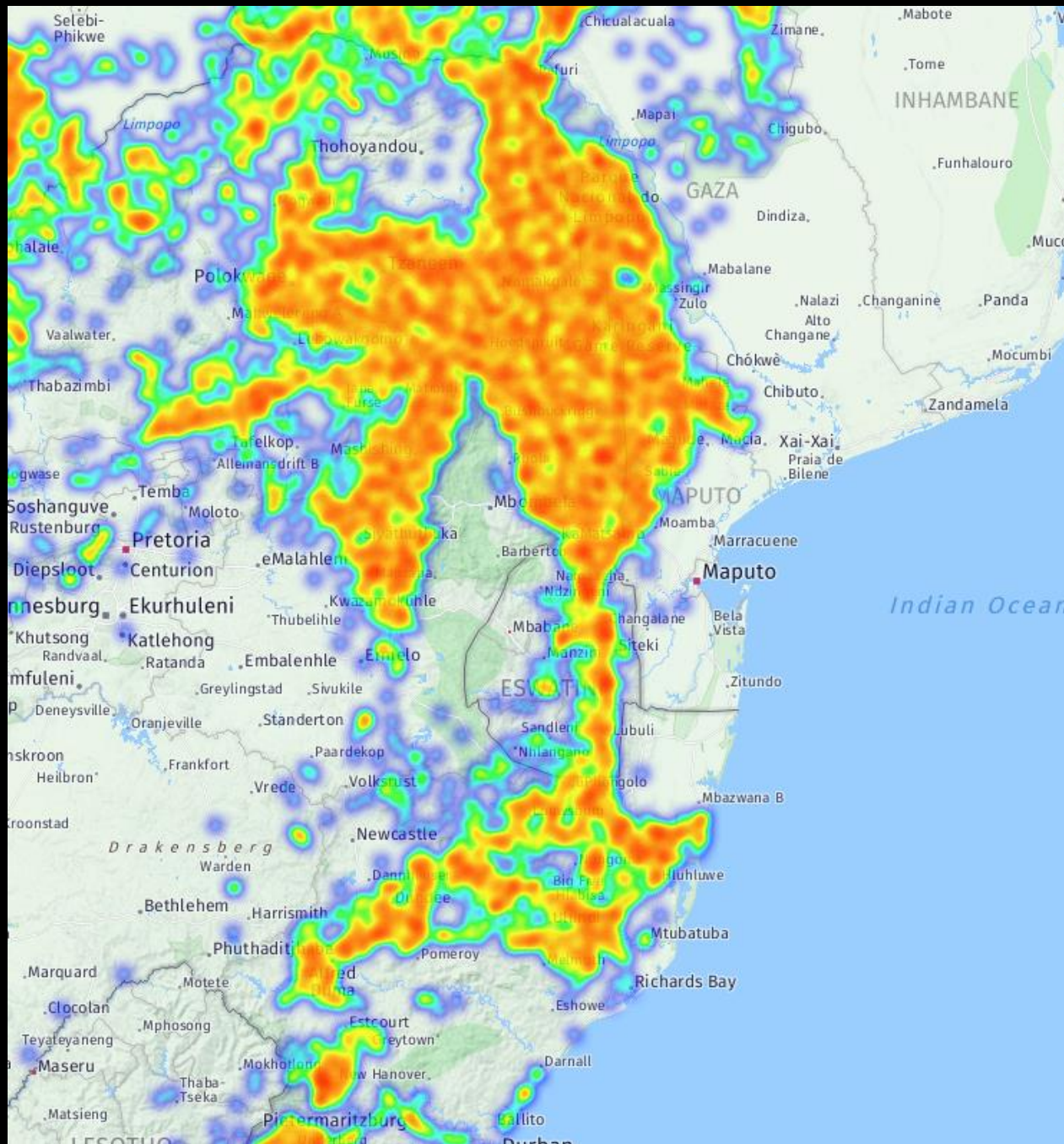
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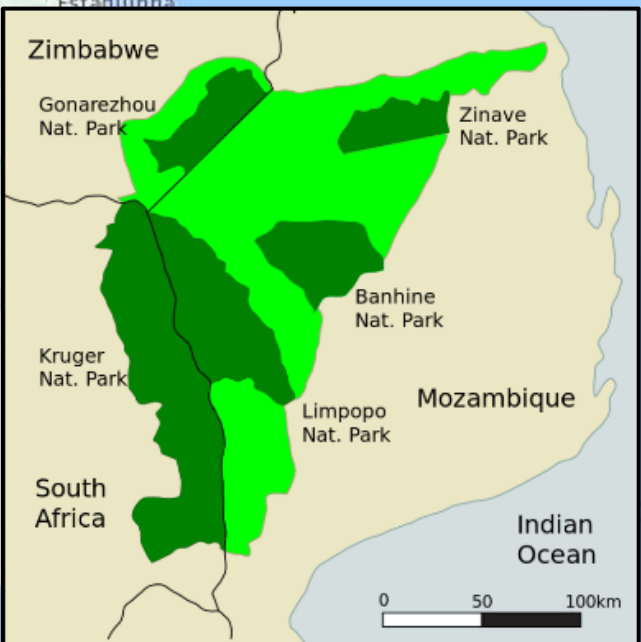
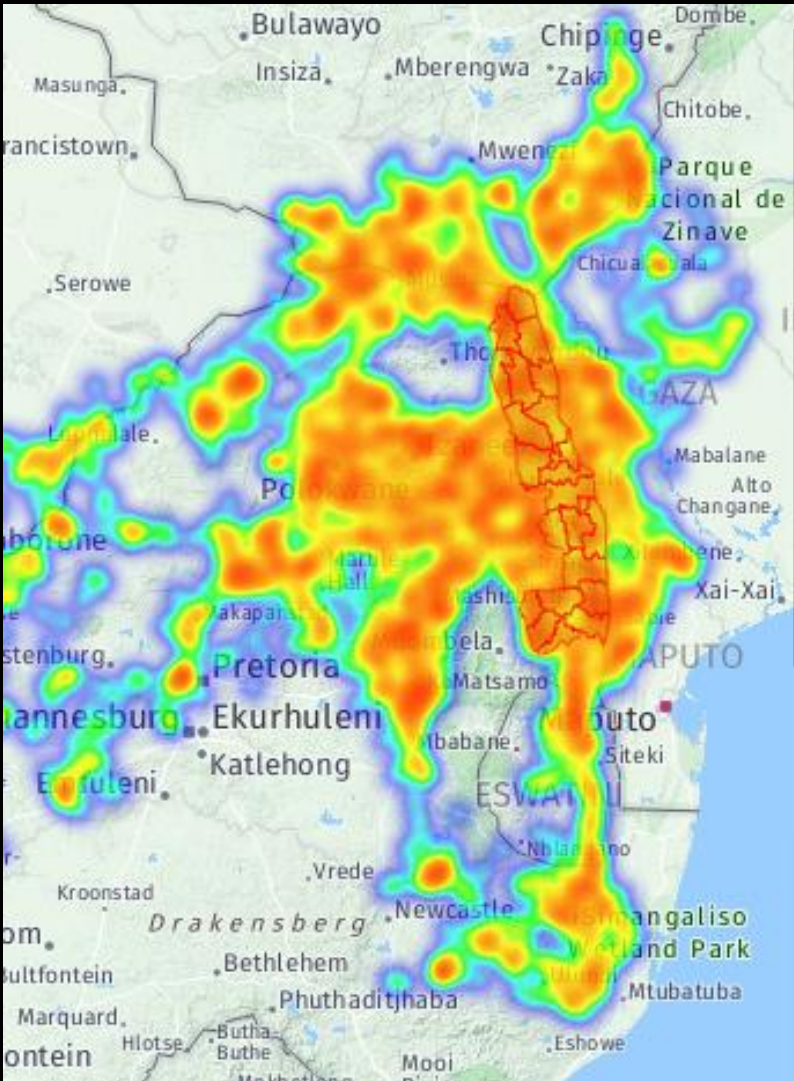
Treatment of Survivors



2023-07-01 00:45:00





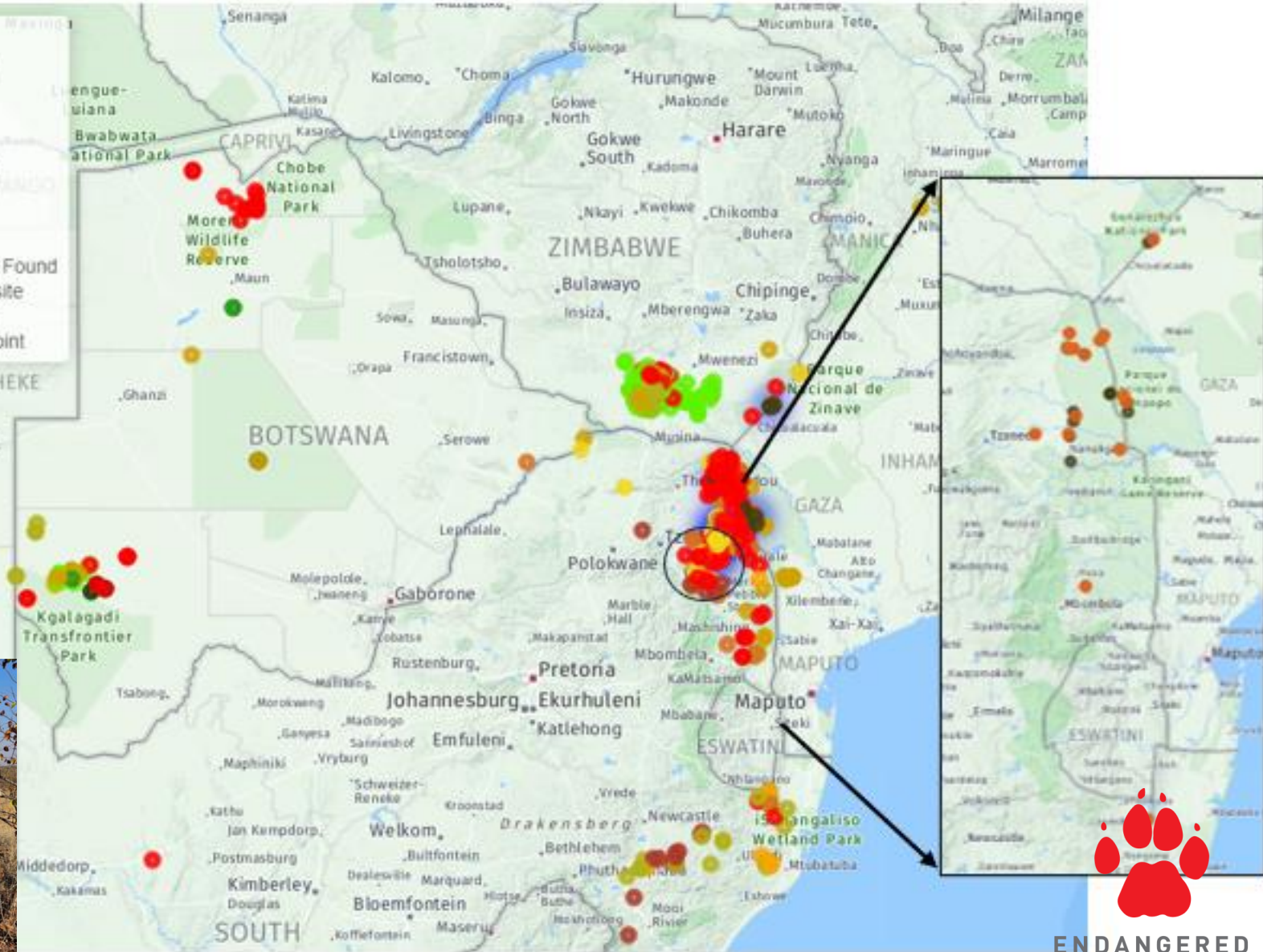


GLTFCA
128 VULTURES
TRACKED
COVERING >2,5
MILLION KM²



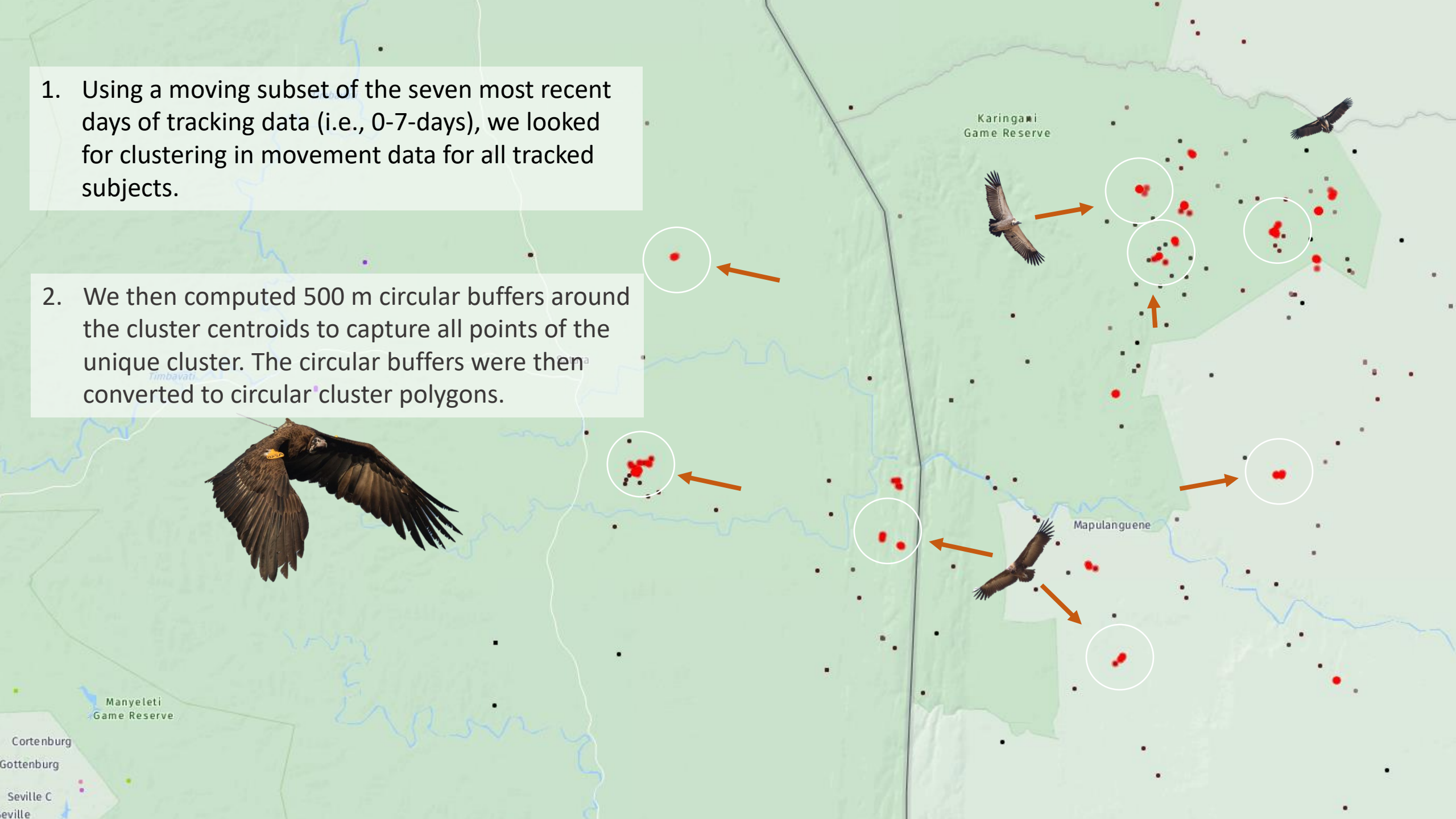
The **Great Limpopo Transfrontier Conservation Area (GLTFCA)** spans approximately **100,000 square kilometers (39,000 square miles)** across three countries: **South Africa, Mozambique, and Zimbabwe**

FOLLOWING UP ON EYE IN THE SKY ALERTS

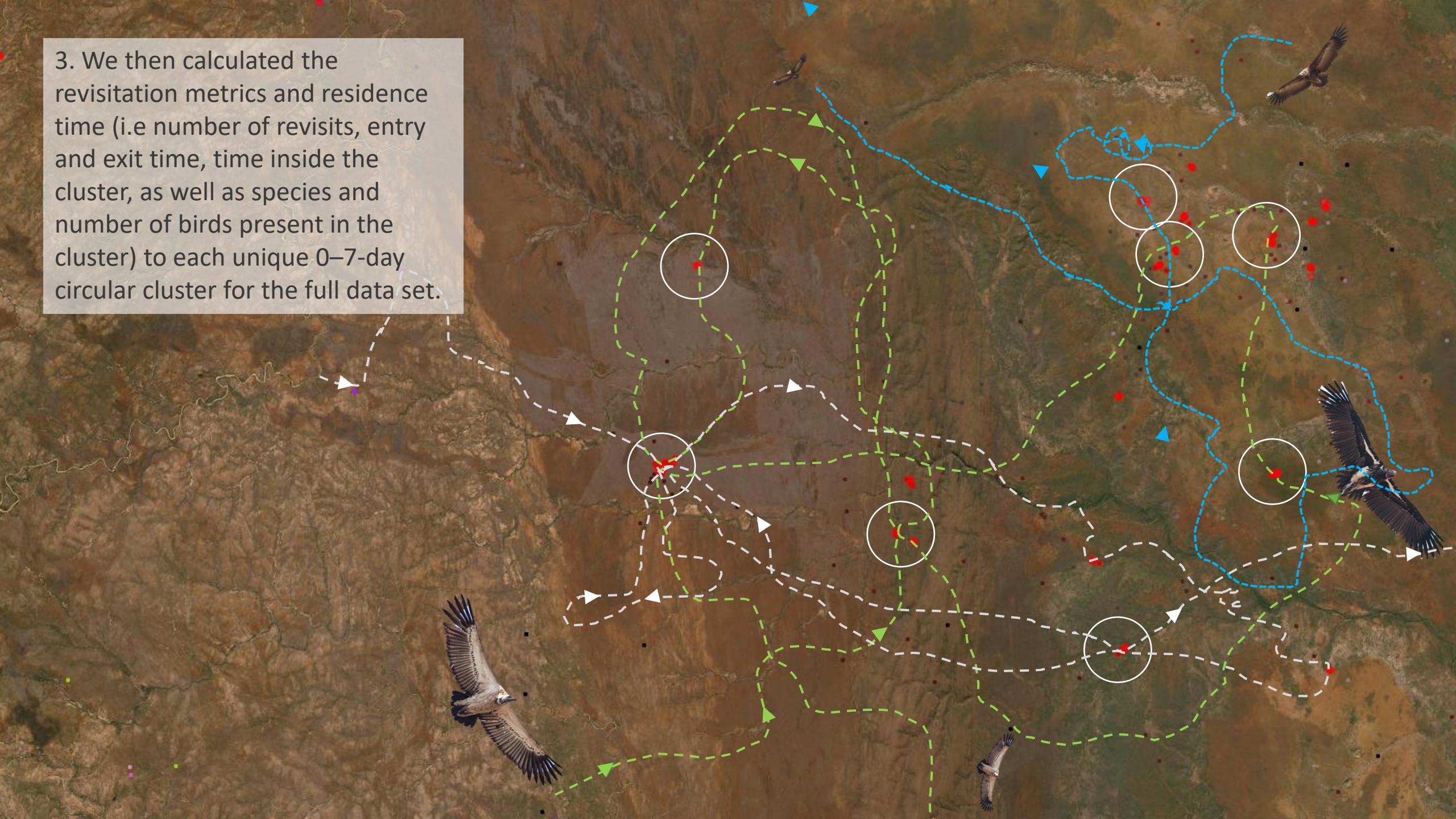


1. Using a moving subset of the seven most recent days of tracking data (i.e., 0-7-days), we looked for clustering in movement data for all tracked subjects.

2. We then computed 500 m circular buffers around the cluster centroids to capture all points of the unique cluster. The circular buffers were then converted to circular cluster polygons.



3. We then calculated the revisitation metrics and residence time (i.e number of revisits, entry and exit time, time inside the cluster, as well as species and number of birds present in the cluster) to each unique 0–7-day circular cluster for the full data set.



4. Feeding clusters were classified as clusters that were only visited in the 0–14-day time window. Clusters visited more regularly were assumed to be roosts, watering points, supplementary feeding sites or breeding sites

Cluster visited regularly over last 180 days



Roost

Cluster visited only in last 0-14 days



Feeding detected



Feeding detected

Cluster visited only in last 0-7 days



Feeding detected



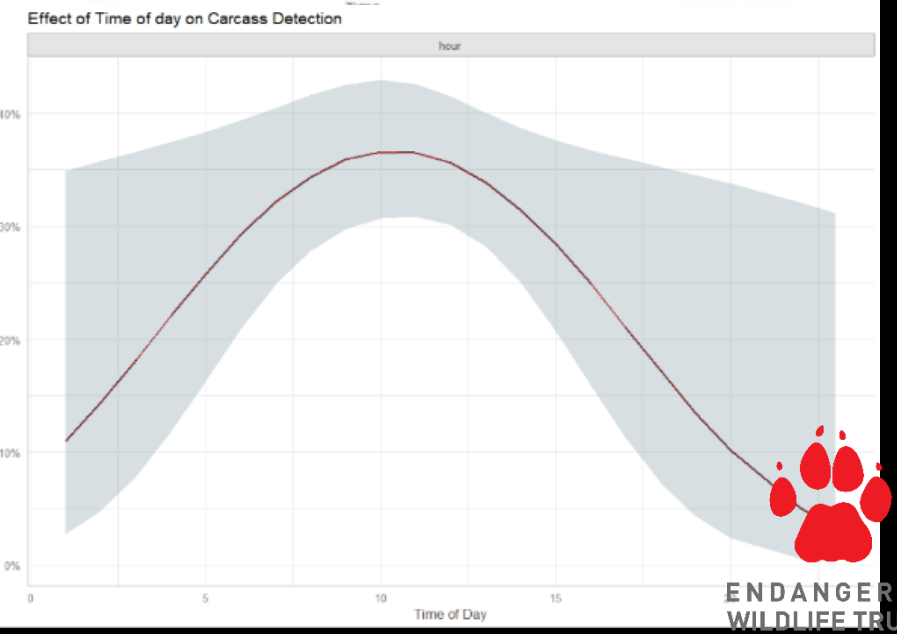
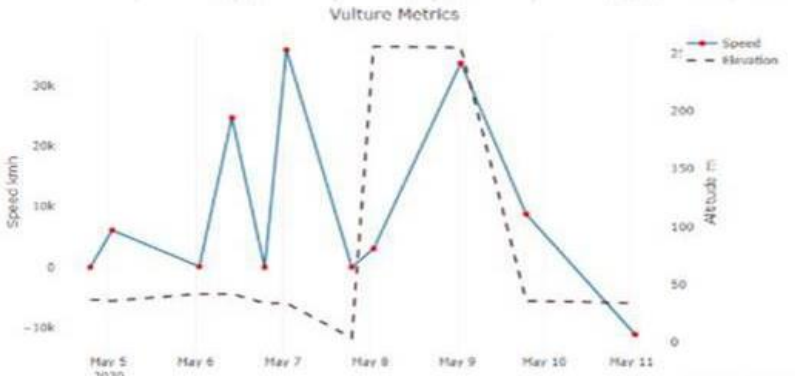
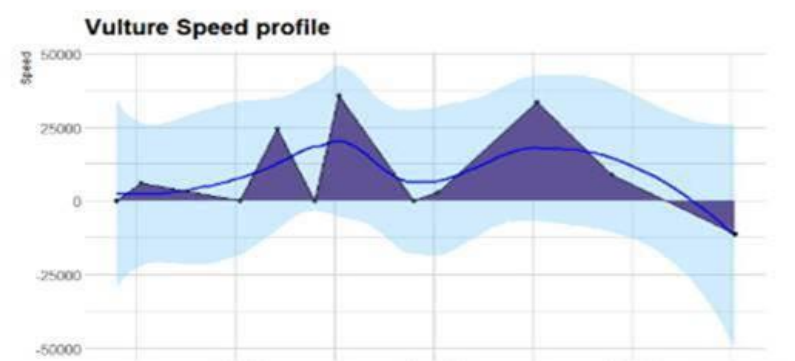
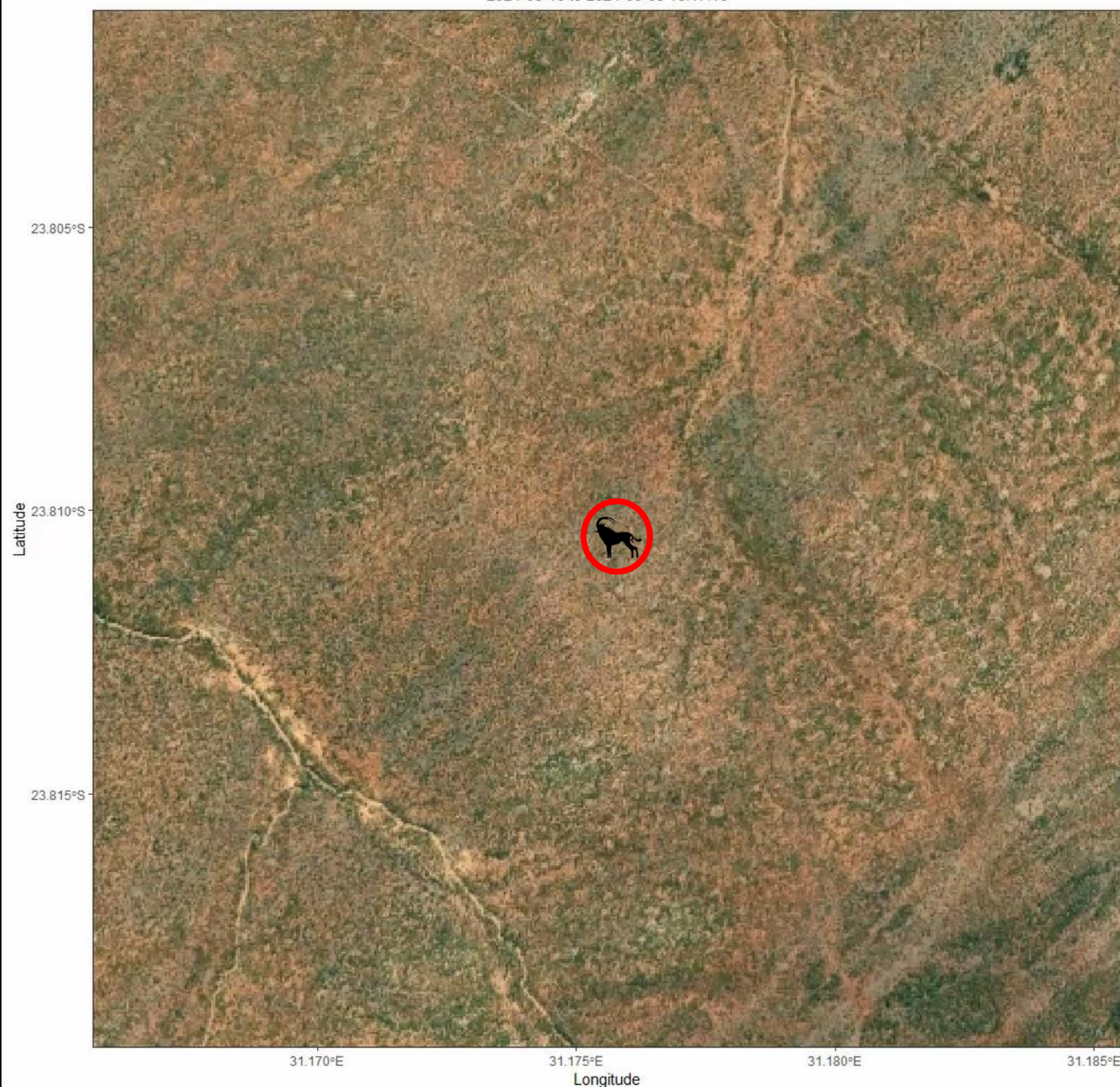
Roost

Cluster visited regularly over last 180 days



Water point

Cluster visited regularly over 365 days



EYE IN THE SKY

Business Account

eits status bird WBV_NSR_4262 time12h 09:51 ✓✓

eits status bird WBV_NSR_4262 10:48 ✓✓

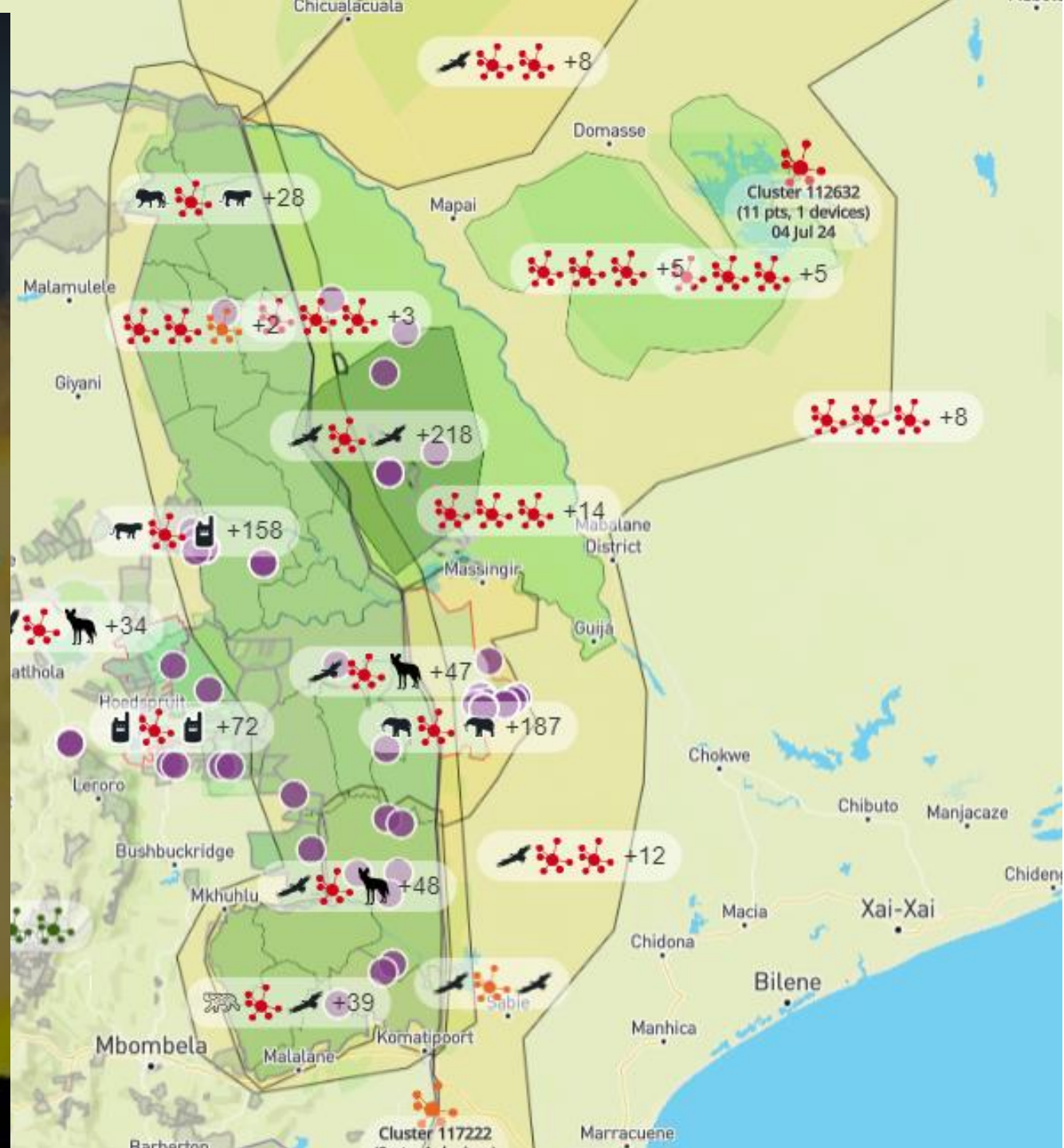
WBV_NSR_4262 status. Last location at 2023-03-07 07:49:07 UTC on www.google.co.za/maps/place/-12.614200,37.474250 with a distance traveled of 18.3m over the last 8 hours with 4 associated points. 10:48

eits status bird WBV_NSR_4269 time8h 10:49 ✓✓

WBV_NSR_4269 status. Last location at 2023-03-07 07:00:22 UTC on www.google.co.za/maps/place/-11.603610,38.291980 with a distance traveled of 165.4m over the last 8 hours with 5 associated points. 10:50

Vulture mortality risk alert 25884475099. The animal associated is WBV_NSR_4262, on 2023-03-07 06:51:06 UTC, with a risk level of Savannah 100%. The risk can be viewed at this spatial www.google.co.za/maps/place/-12.61424,37.47426 location. 11:07

Vulture mortality risk alert 25884475100. The animal associated is WBV_NSR_4262, on 2023-03-07 07:30:01 UTC, with a risk level of Savannah 100%. The risk can be viewed at this spatial www.google.co.za/maps/place/-12.61428,37.47424 location. 11:08





AN EYE IN THE SKY

MASTER SYSTEM



EARTHRAINER

A satellite-style map of the African continent is shown in the background. The map is overlaid with numerous small, colored dots representing alerts. The dots are concentrated in the southern and eastern parts of the continent, particularly in the regions of South Africa, Mozambique, and Zimbabwe. The colors of the dots correspond to the alert levels listed in the text: red, amber, green, and grey. The map shows the natural terrain and vegetation of Africa, with the ocean visible to the west, east, and south.

JANUARY 2023

DEC 2023

Red – 54,236

Amber – 33,305

Green – 16,671

Grey – 1,034

**Total Alerts –
105,246**

JANUARY 2023

DEC 2023

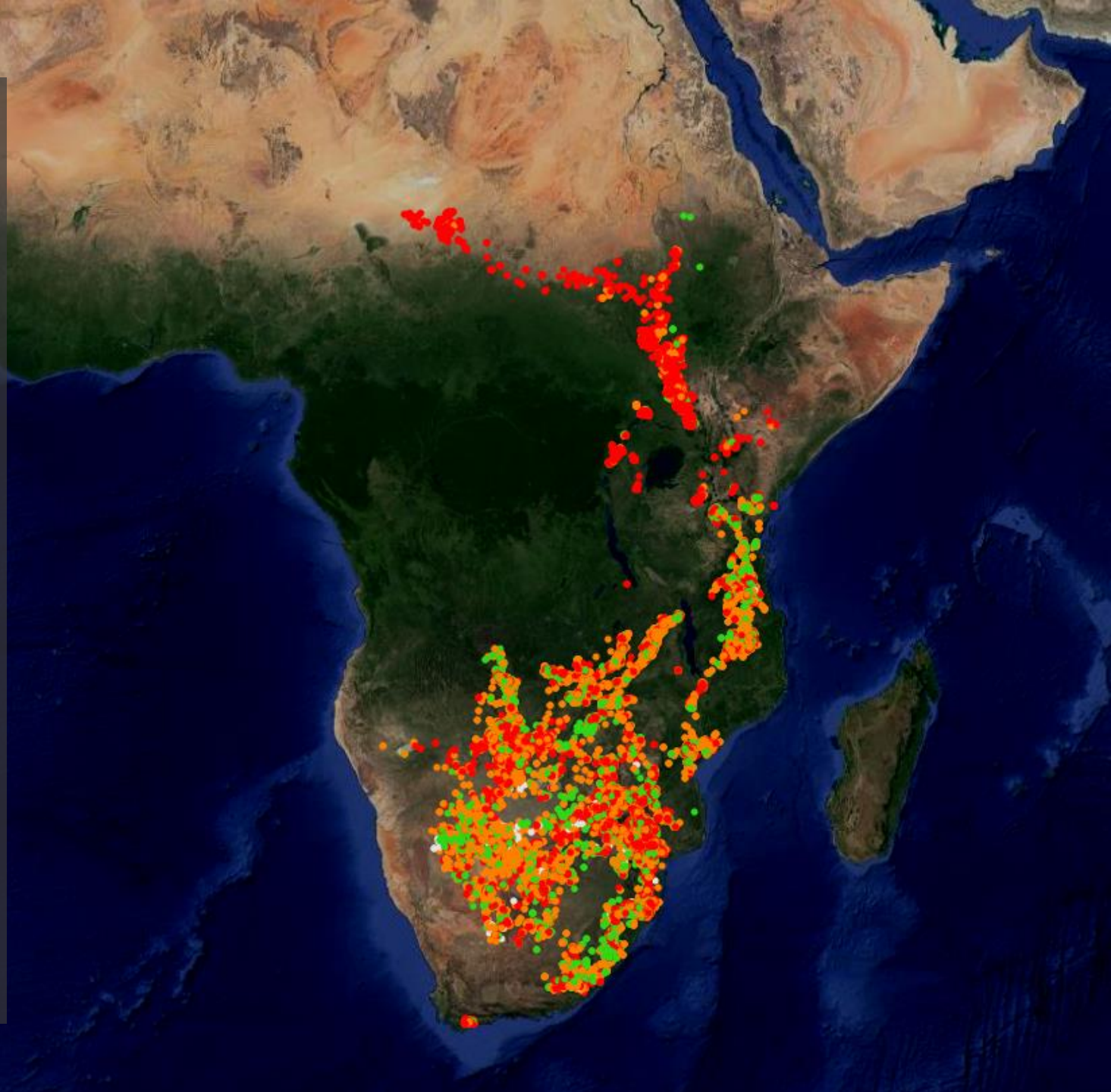
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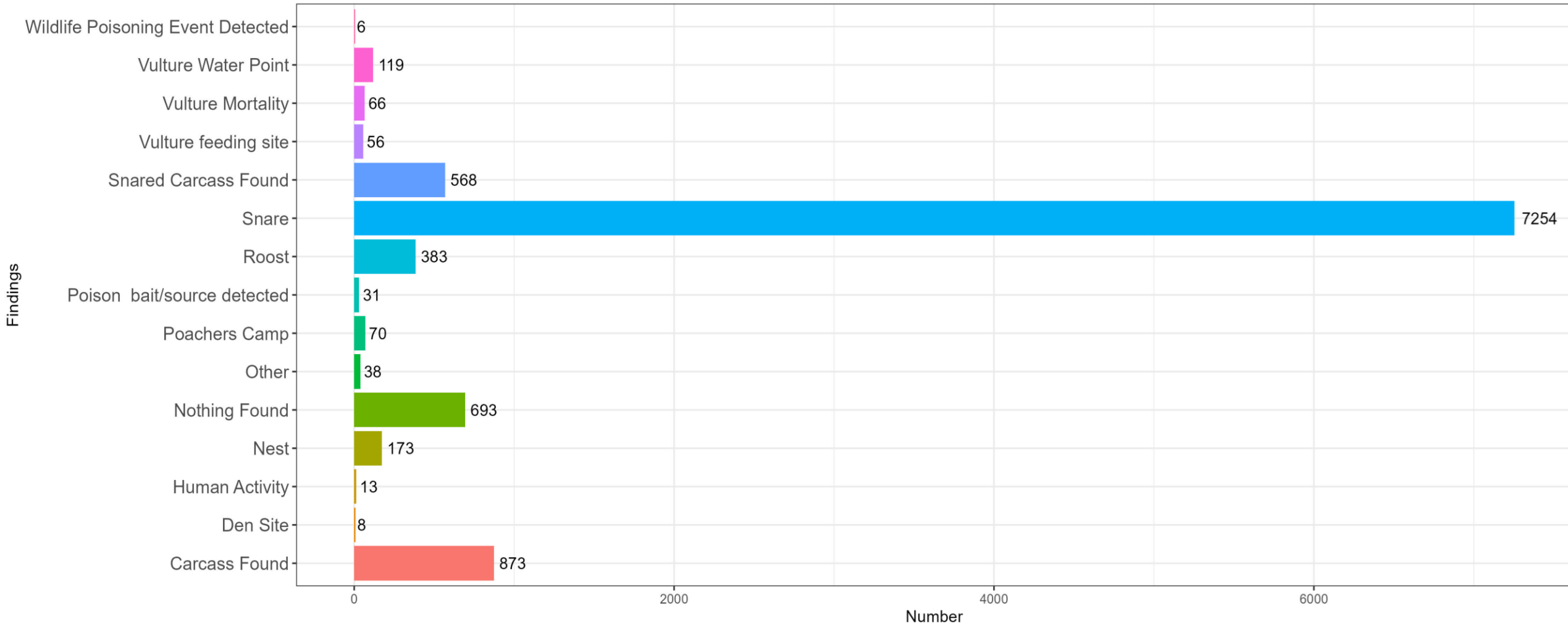
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AN EYE IN THE SKY

USING GPS-TRACKED VULTURES TO DETECT AND RESPOND TO POISONING EVENTS



2021 to 2025





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AN EYE IN THE SKY

USING GPS-TRACKED VULTURES TO DETECT AND RESPOND TO POISONING EVENTS



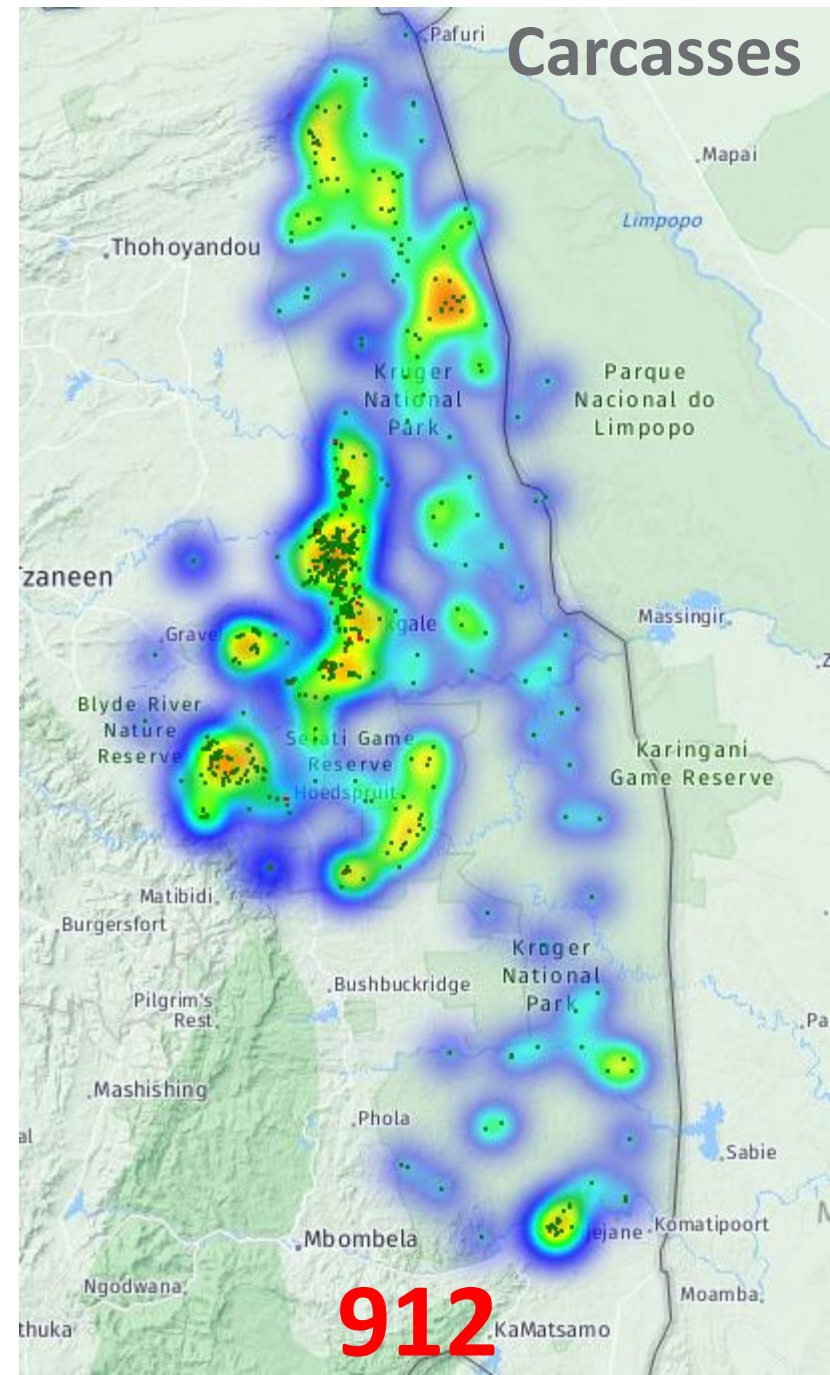
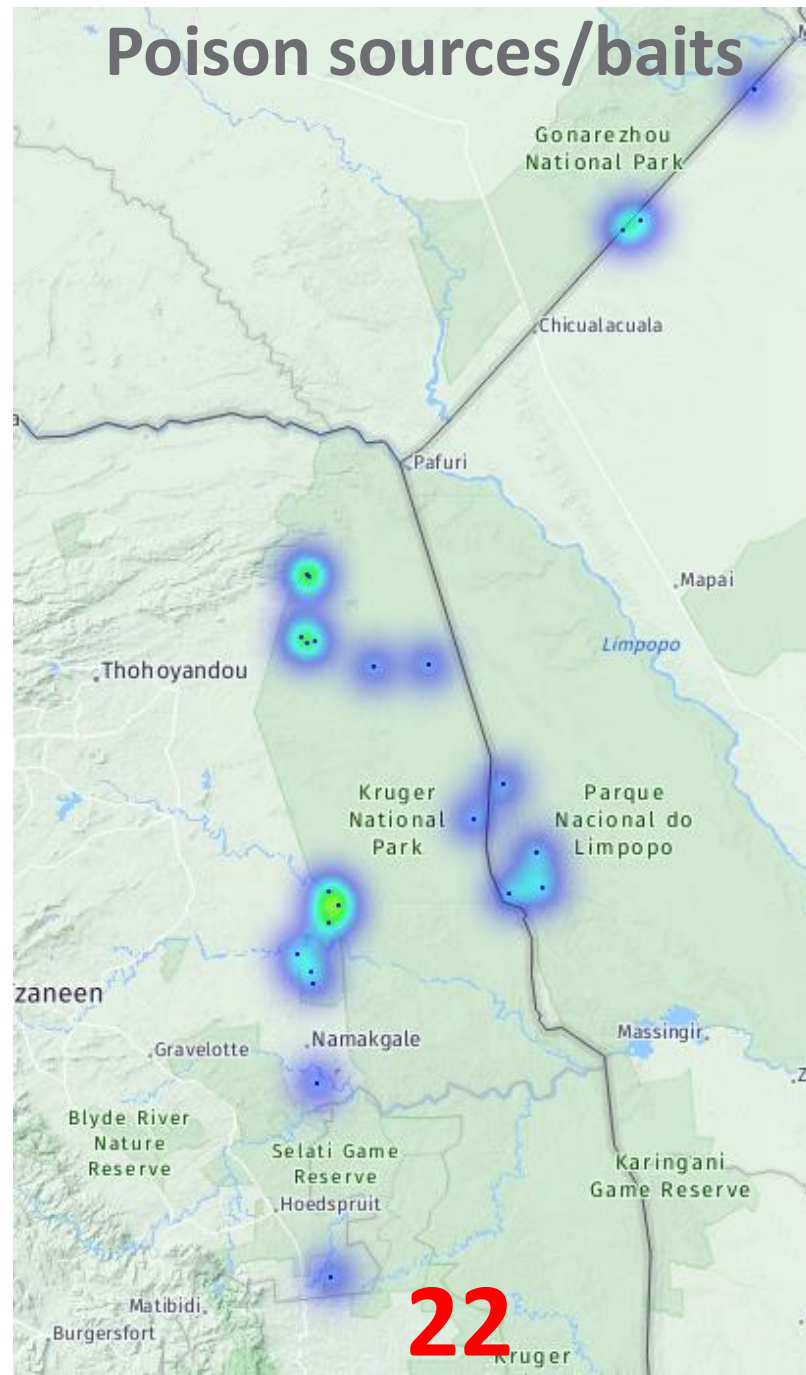
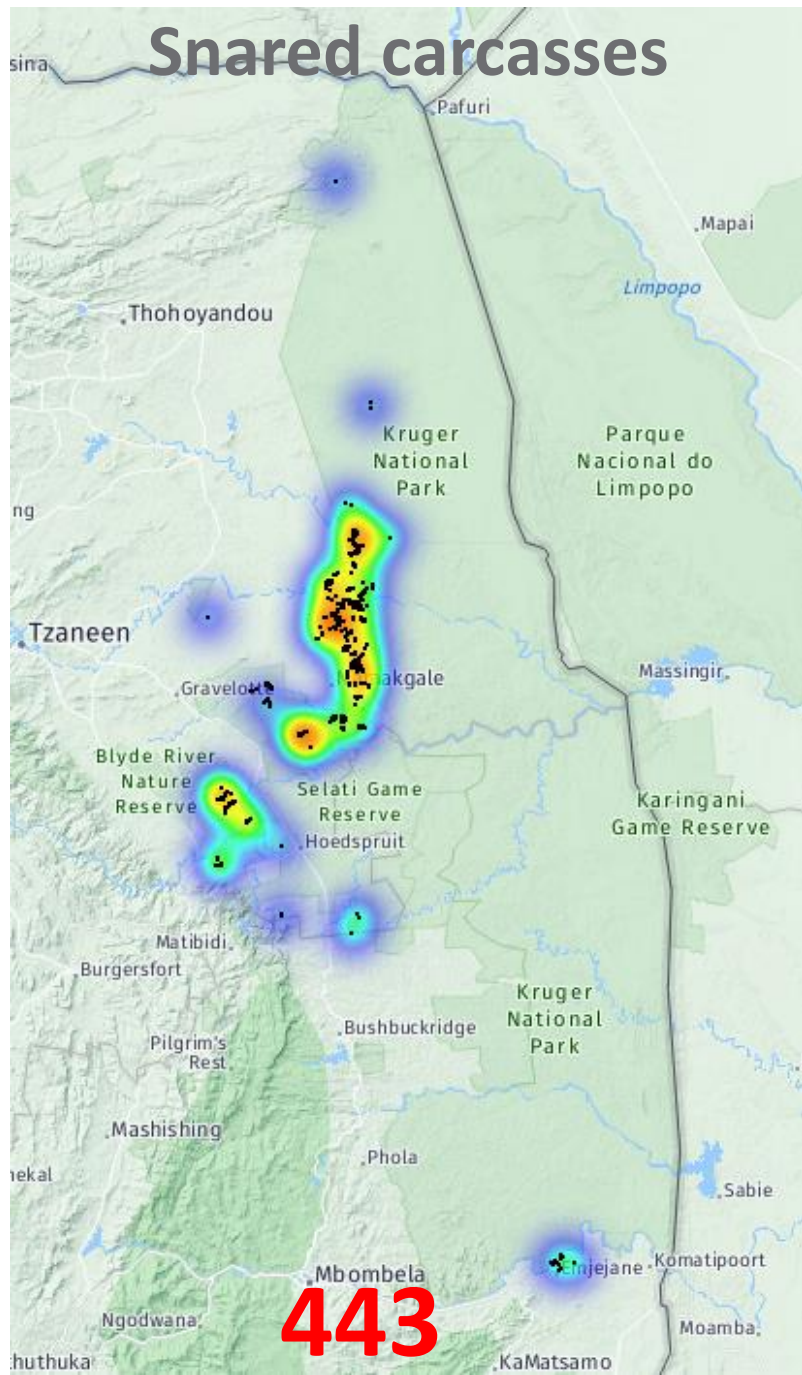
Enhanced Snare Detection



>7,250 snares removed since
January 2021 across southern
Africa



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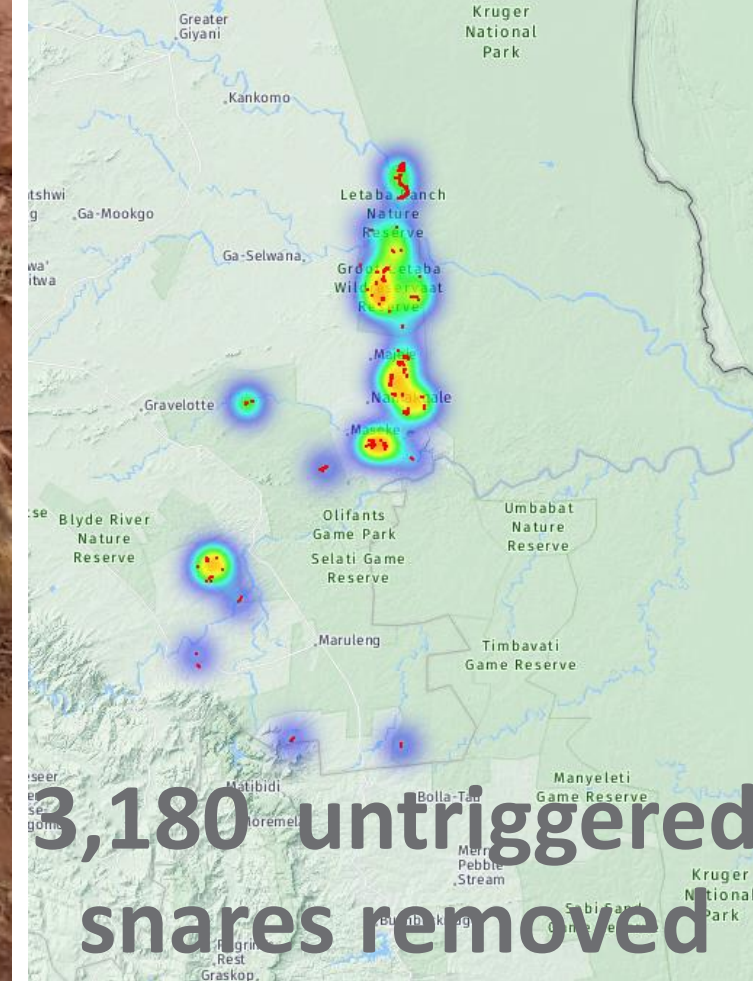




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AN EYE IN THE SKY

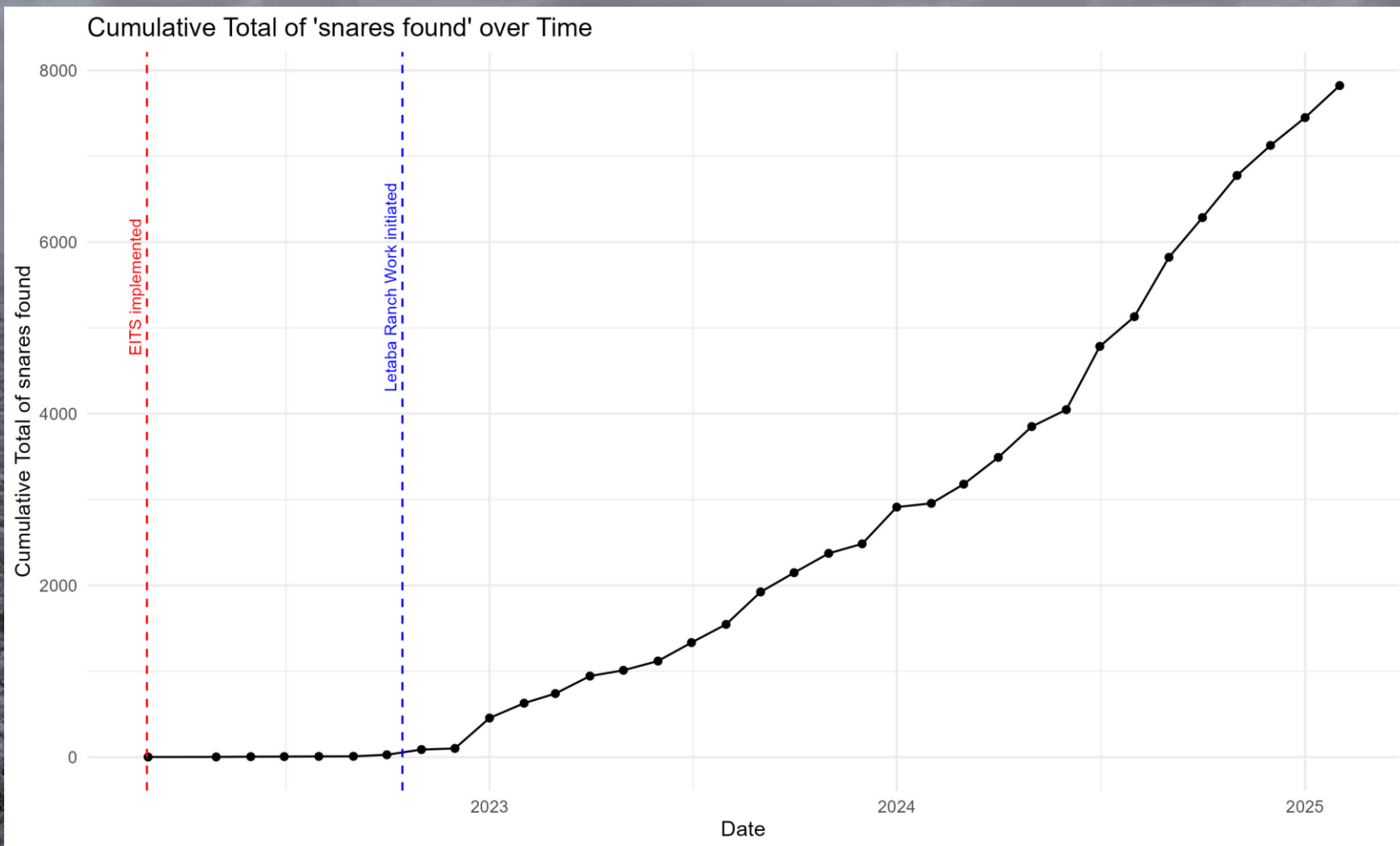
SNARE DETECTION





AN EYE IN THE SKY

SNARE DETECTION



- REPORTING OF SNARES ACROSS LARGE LANDSCAPES
- IMPROVING COMMS & INFORMATION SHARING
- MONITORING TRENDS AND HOTSPOT AREAS
- COORDINATION OF ALERTS AND SNARE SWEEPS



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SNARING & POISONING

The link between snaring and wildlife poisoning is clear, and can lead to catastrophic impacts

POISONING TIMELINE

1

Poacher sets
snare



2

Animal killed
in snare



3

Meat taken
from carcass



4

Carcass
laced with
poison



5

Poisoning of
target or
non-target
species



BY ACCELERATING THE SPEED OF DETECTION FOR SNARING SITES, IT AFFORDS A CHANCE TO FIND POISONING EVENTS EARLIER, OR EVEN STOP THEM FROM HAPPENING ALTOGETHER.





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THE FUTURE OF EYE IN THE SKY

Finding new ways to improve the application of vulture tracking data for conservation.

Vulture Spatial Use (Log Scale)

Unique Individuals per 3km² Grid Cell (Log Scale)

21°S

21°S



30°E

31°E

32°E

Longitude

33°E

34°E

30°E

31°E

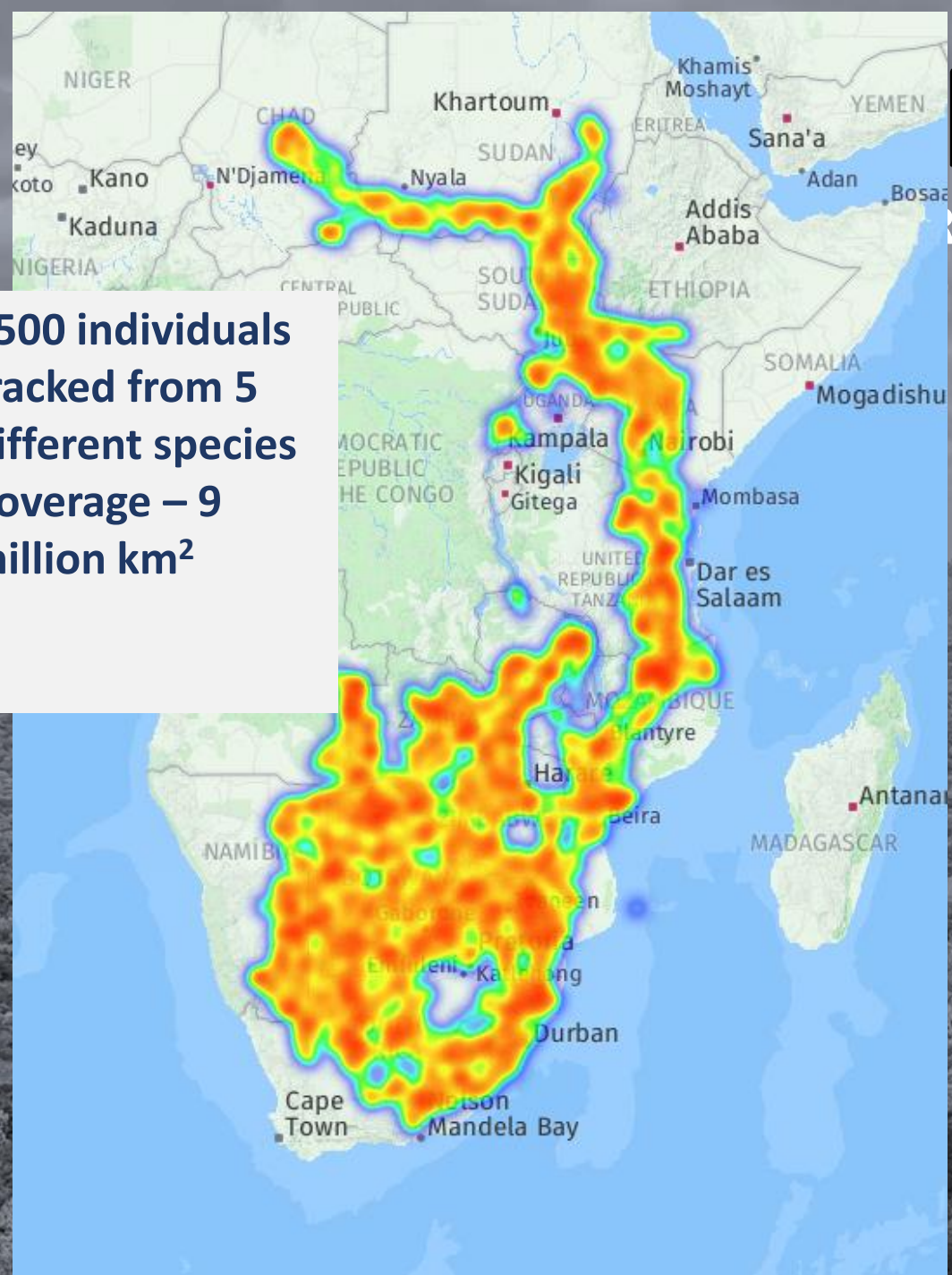
32°E

Longitude

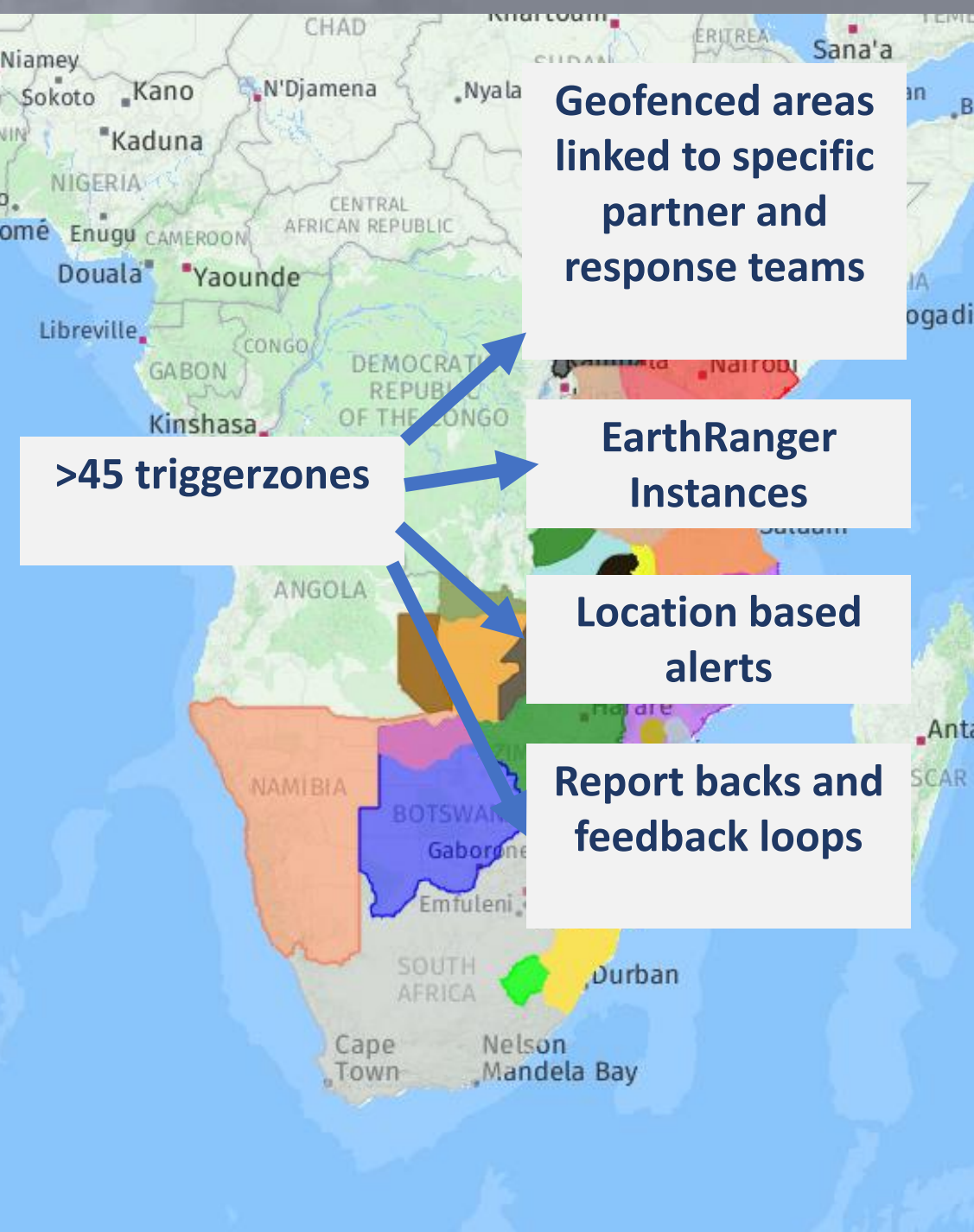
33°E

34°E

- >500 individuals tracked from 5 different species
- Coverage – 9 million km²



MONITORING RESPONSE



>45 triggerzones

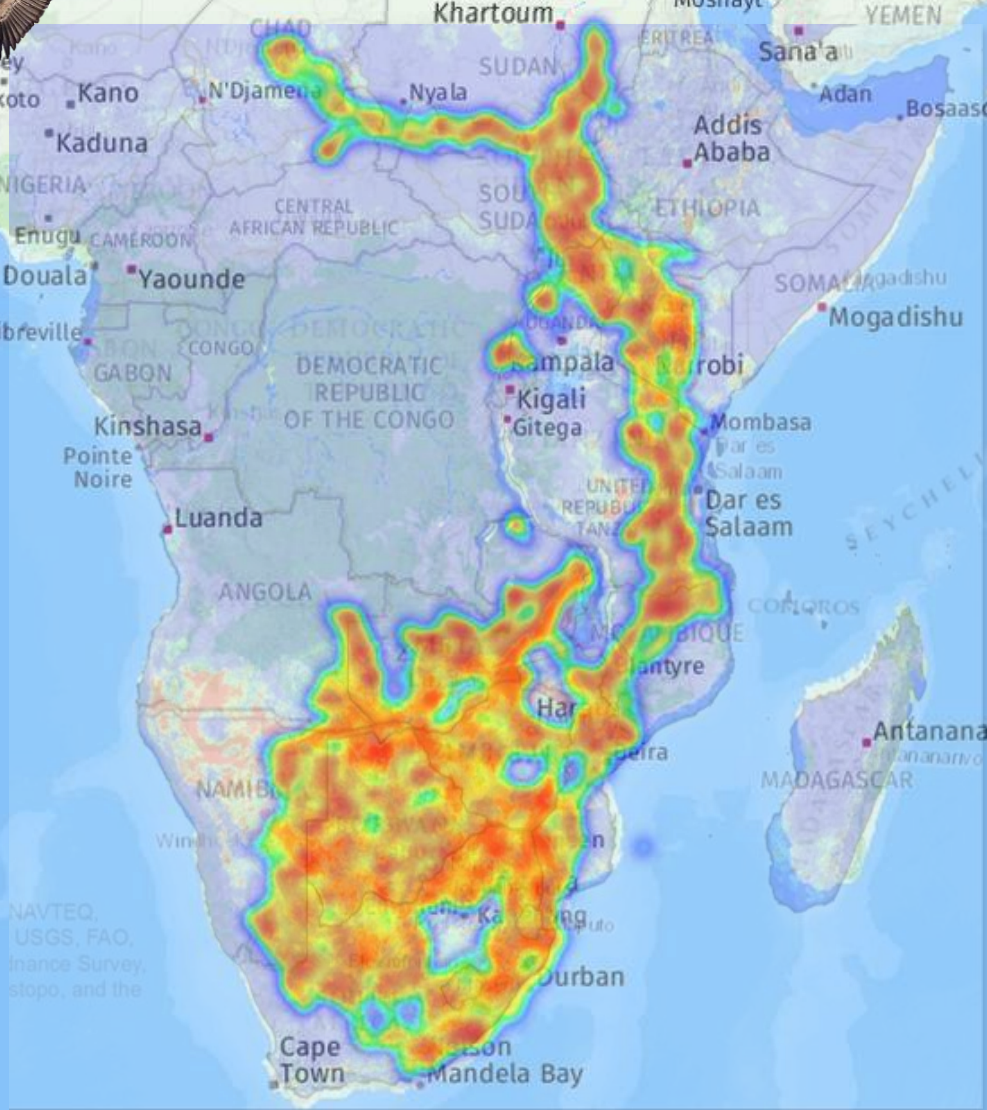
Geofenced areas linked to specific partner and response teams

EarthRanger Instances

Location based alerts

Report backs and feedback loops

AN EYE IN THE SKY - AFRICA



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MAX-PLANCK-GESELLSCHAFT



Leibniz Institute for Zoo and Wildlife Research
IN THE FORSCHUNGSVERBUND BERLIN E.V.



Bird Watch ZAMBIA



CARING FOR CONSERVATION



CSL CONSERVATION SOUTH LUANGWA



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CONTEMPLATE

Wild



MAX-PLANCK-GESELLSCHAFT

North Carolina ZOO



South African NATIONAL PARKS



Briandez Legacy Trust
Conservation & education



MOHOLOHOLO

the experience of a lifetime



USAID
FROM THE AMERICAN PEOPLE



ZAMBEZE DELTA
CONSERVATION



Raptors Botswana



KARINGANI
PEOPLE WILDLIFE CONSERVATION



NATIONAL GEOGRAPHIC



UGANDA CONSERVATION FOUNDATION

CONSERVATION IN ACTION



EARTH RANGER



PEACE PARKS FOUNDATION



NIASSA CARNIVORE PROJECT



CARING FOR CONSERVATION



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IN THE FORSCHUNGSVERBUND BERLIN E.V.



CSL CONSERVATION SOUTH LUANGWA



PNHF
PHILIPPINE NATURAL HERITAGE FOUNDATION - NPC



WCS



CHULEXI CONSERVANCY

Reserva Especial do Niassa



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A BIG THANKS TO OUR FEATHERED RANGERS!

Dr. Gareth Tate

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Mobile: +27 82 447 3619

E-mail: garetht@ewt.org.za